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RESEARCH ARTICLE
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CORELATION OF FACIAL AND DENTAL MIDLINES IN DENTATE POPULATION OF NORTH BIHAR

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Abstract

Background: In the current scenario, esthetics, especially An important reason for seeking oral and facial rejuvenation is its esthetics treatment from dental health professionals. Esthetics are subjectively assessed and may not always match the patient's perception. However, there is an optimal appreciable deviation that can be acceptable with pleasing esthetics achieved through orthodontic, prosthodontic and cosmetic treatments. The aim of this Several deviations between the midlines of the maxillary and mandibular jaws were measured during the study dental midlines in male and female subjects of Bihari population. The study included 600 subjects, out of which 300 males and 300 females were selected based on inclusion criteria. Photographs as well as diagnostic casts were made for each patient and statistically analyzed. The results suggest that around 80% of the North Bihari population have coinciding facial and maxillary midlines, which can be used as an authentic and suitable template for arranging maxillary teeth in prosthesis fabrication. A small deviation of 1-2 mm in mandibular midline is acceptable and can be used to provide a life-like appearance to the prosthesis.

Keywords: Cast, Deviation, Midline, Orthodontic treatments, Proportion, Prosthesis.

INTRODUCTION

In the modern world, looking balanced is a prime concern, and a pleasing appearance is closely linked to professional success and social acceptance. Beauty is a combination of reality and personal perception. The study of elements of beauty and analyzing them by certain human-made references constitutes dento-facial esthetics[1]. Esthetics, especially Several treatments, including orthodontics, prosthodontics, and cosmetics, are performed for the purpose of improving facial esthetics 2-4. There is a lot of subjectivity involved in assessing esthetics, and professional and patient perceptions

may not always be in agreement5. In symmetry, facial components on each side of the sagittal plane are equally large, situated, shaped, and arranged6. The facial midline is determined by landmarks such as the nose, philtrum, and pogonion aligned in a straight line. As teeth are in maximum intercuspation on both maxillary and mandibular arches, the dental midline lines up with this line. Ideally, both facial and dental midlines should coincide in a straight line[7]. Tjan[8] and Lombardi[9] also stated that For proper stabilization, the midline must be located properly in order to achieve cohesion or oneness between the dental components.

It is important to understand Dental midlines coincide with facial midlines and maxillary midlines with mandibular midlines in the majority of the population for dental health professionals, especially orthodontists, prosthodontists, and maxillofacial surgeons, to execute treatment plans and treatments for pleasing Oro-facial esthetics in the area of people they are treating. However, This parameter has not been studied in depth in the Bihari population due to the lack of scientific data.

Observable deviations between facial and dental midlines as well as between maxillary and mandibular midlines were determined in this study dental midlines in male and female subjects of North Bihar population. The null hypothesis states that no difference exists between the population of North Bihar region when compared for facial and dental midlines and maxillary and mandibular midlines

MATERIALS & METHOD

Materials

The Dell Inspiron 14 2-in-1 laptop has a configuration of The 12th Gen Intel Core i3-1215U processor is paired with Intel UHD graphics and is equipped with 8GB of RAM of random access memory (1 x 8 GB DDR4, 3200 MHz), and a hard disk of 512 GB M.2 PCIe NVMe. It also has a high-resolution touch display Full HD+ display of SSD 35.5-cm (1920X1200) with other input devices like a mouse and keyboard. The software used is Windows 10. Adobe Photoshop Version 7.0 is a raster-based image editing software that has many advanced features for compositing since the selection tools are so handy that one can use its various features of measurements Image quality is not compromised. Corel software and Microsoft Office WordPerfect are used to analyse and record the results.

The Canon EOS 1500D Digital Single Lens Reflex (DSLR) has an image resolution of 24.1 Mega Pixels and a photo sensor APS-C with optical image stabilization. It has a color monitor screen with a 2-inch LCD that can be rotated up to 270 degrees, which helps to view taller objects for the area of The camera can be held at a height without having to raise it. It is recommended that dental and medical lenses have at least 5 Mega Pixels photography10-12. The camera has an optical zoom of 60x for The quality of the image is better. In dental/medical photography, a zoom of 39 is recommended. It produces images equivalent to 35-140 mm lenses due to its lens specifications of 7.3-29.2 mm. An image of adequate accuracy must have a 35mm lens specification at international conferences[10-13]

The present study was conducted on 600 patients who consulted private clinics for dental problems in different districts of North Bihar. Out of these 600 patients, In the study, 300 males and 300 females were selected on the basis of the following factors:

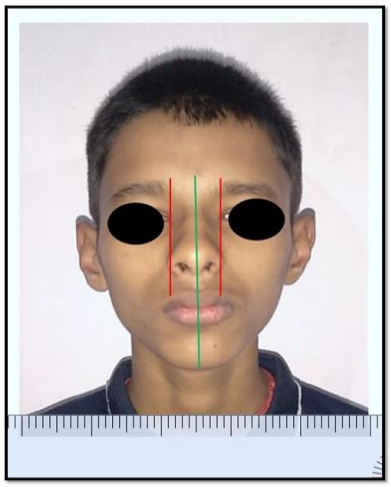
Inclusion criteria

Age group of 18-40 years for both genders, no medical history or history of trauma or congenital diseases, no dental history of orthodontics or prosthesis treatment, presence of complete dentition up to the second molar in each quadrant of the jaw, and patients with near to Teeth aligned in the ideal position.

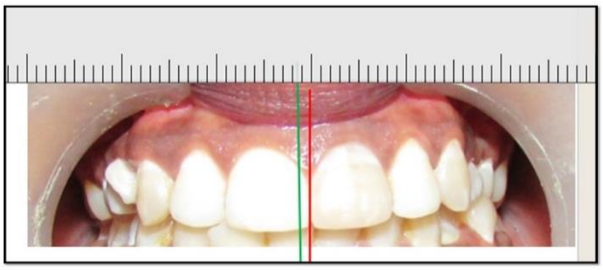
Exclusion criteria

Patients with dental fillings in A periodontal disease that is active on the anterior teeth, intra-arch malocclusion like severe There are several types of congenital defects of the head and neck region, including rotations, spacing, and crowding of the anterior segment of the jaw.

Written consent was obtained from each patient after they were informed about the study's purpose. Patients were instructed to stand comfortably with They are looking out with their eyes open and their heads upright forwardly at a distant object. Two photographs were taken for each patient, one in a relaxed and rest position with lips at rest as normal, and the second photograph was taken with the patient smiling with visible maxillary dentition An upper central incisor's midline. The images were opened using Corel Photoshop Pro, and A laptop screen frame was parallel to the interpupillary line in which photographs were taken. The images were magnified using easy and handy tools available, such as zoom, so that the On the subject and the image, the width of the central incisor coincided. “Pen tools” were used to mark one of two points on the medial border of the inner canthus of the eye using measuring guidelines that The following points were drawn. The reading of measurements As shown in Picture 1, millimetres were measured between the two points. Perpendicular lines bisecting the intercanthal distance were used to mark the midline of the face. Guide tools were used for In between the upper central incisors, there is a dental midline. Pictures 2 and 3 show differences between the maxillary dental midline and the facial midline in millimetres. As shown in Picture 3, differences between the mandibular dental and facial midlines were also measured in millimetres. The differences or coincidence We measured the distance in millimeters between the midline of the facial region and the midline of the maxilla. Furthermore, facial and mandibular dental midlines were measured in millimetres for comparison as well. All images used during the study were well stored in JPEG format.



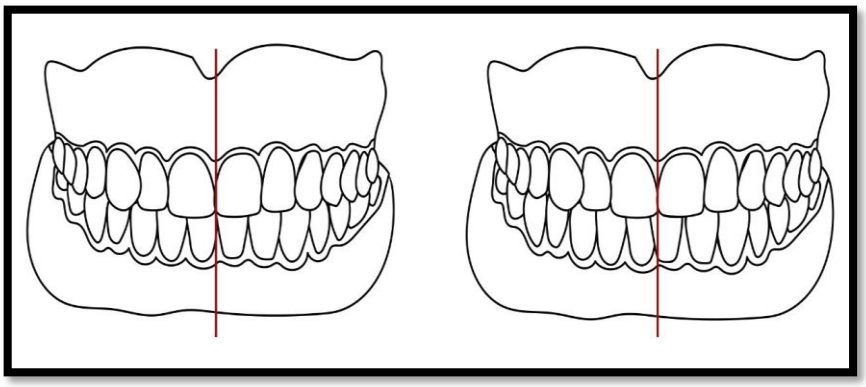
Pic.1 Computation of facial midline



Pic.2 Computation of facial midline with maxillary dental midline

Pic.3 : Computation of intermaxillary midline

To evaluate The midline of the maxilla and mandible coincides, impressions of each patient were made in elastomeric impression material (Colten Speedex Putty) and poured in Type III dental stone (Kalabhai Ultra Rock Die). Using a mean value articulator, the casts were mounted in maximum intercuspation position and evaluated for coincidence as depicted in Picture 4. Any deviations in photographs as well as on casts were also noted and analyzed statistically



Pic. 4 : Schematic illustration Mounted on an articulator, the intermaxillary midline of diagnostic casts.

RESULT

The data obtained reveals that out of 600 patients, 480 subjects had a coinciding facial and dental midline, out of which 237 were males and 247 were females. The remaining 116 people who did not have matched facial and dental midline had a deviation to either the right (41) or left (75) [Table-1]. The data analysed for coinciding maxillary and mandibular midlines on photos of patients and dental diagnostic models states that 360 out of 600 patients had matched maxillary and mandibular midlines. The remaining 240 patients consist of 118 males and 122 females with deviated midline, 144 cases were deviated to left while 96 were deviated to right [Table-2]. Analysis of variance reveals statistically significant differences between subjects when compared for facial as well as dental midlines. (P>0.005).

	Total	Male	Female
Number of subject	600 (100%)	300(50%)	300(50%)
Coinciding	484 (80.6%)	237(79%)	247(81%)
Non coinciding	116 (19.4%)	62 (54%)	54(46%)
Deviated to left	75 (65 %)	42 (57 %)	33(43%)
Deviated to right	41 (35 %)	23(56%)	18 (44%)

Table 1 : Analysis of facial and dental midline

	Total	Male	Female
Number of subject	600 (100%)	300(50%)	300(50%)
Coinciding	360 (60%)	182(60.6%)	178 (39.4%)
Non coinciding	240 (40%)	118 (49.2%)	122 (50.7%)
Deviated to left	144 (60 %)	53(44.9 %)	91(74.3%)
Deviated to right	96 (40%)	65(55.02%)	31 (25.5%)

Table.3: Analysis of maxillary and mandibular dental midline

DISCUSSION

Smile is a key factor contributing to beauty of an individual. Any dental treatment without esthetic consideration is half treatment done. Facial symmetry, midline and proportions forms the back bone

of any dental treatment and must be balanced so that to provide a harmonious, healthy smile to patient. Null hypothesis that no difference exists between subjects in terms of coinciding facial and Maxillary and mandibular midlines and dental midlines stands rejected as a significant difference of 20% exists in facial and dental midline and 40.62% in maxillary and mandibular midline respectively. Inclusion criteria were strictly followed to avoid any false readings. Photographs were used to mark 3 points and reference lines on the face for marking facial and dental midline as face is a dynamic body and keeps on changing constantly. Also, marking points on face, joining with the straight line and analysing them was a tiresome practice both for dentist and the subject. Evaluation of maxillary and mandibular midline was carried out on the prepared casts as it helped us to evaluate the direction and amount of deviation which was measured by marking with pencil and ruler. Also, it was noted, in entire study the patients standing posture were extra conscious of their midline mismatches, which could have induced bias in the results leading us to use photographs and casts in our study. Since, during smiling the dental midlines is most important point of focus. The patient can easily visualize an off-center midline and their attendant[14]. Boucher advocated Dental arch midline should be located near the centre of the face, with the long axis of maxillary central incisors parallel to the facial long axis[15]. The results of this study state that around 80% of the subjects tested have a coinciding facial and dental midline, which is in concordance with a previous study by Cardash et al[16]. Hasanreisoglu U[17] also stated that facial midline is a reliable method for placement of teeth during fabrication of prosthesis. Hickey, Zarb, and Bolender[18] also suggested matching facial and dental midline as Arrangement of teeth based on a starting point. Most prestigious and reliable prosthodontic textbooks[19] teach us to match maxillary and mandibular midlines in teeth arrangement, which contradicts the results obtained in our study as 40.62% of subjects had no coinciding maxillary and mandibular midlines. Frush and Fisher[20] also suggested dynesthetic interpretation of dentogenic concept which suggests varying the maxillary and mandibular midlines slightly to appear prosthesis look more natural. The studies by Sharma V[2] and Khan MF[21] recorded maxillary and mandibular midline deviations. Another, interesting thing that was observed in this study was that maxillary and mandibular mismatch of 0.5-1mm was unnoticeable in the patient's mouth and can be left as such. Further studies should be conducted at different locations with a large sample selection and can also consider phonetic changes due to different teeth placements positions.

CONCLUSION

The present study suggests us that 80% of North Bihari population has coinciding facial and maxillary midlines and uses it as a reliable guide to arrange maxillary teeth while fabricating prosthesis. The study further suggests us 1-2 mm of deviation is acceptable in mandibular midline can be left as such and used to provide more lifelike appearance to the prosthesis. Photographs of the patient should be recorded in the diagnostic visit only and midline matching should be carried out at photographs only avoiding any chances of false mismatch. It can be used as It can be used during dental prosthesis fabrication or during oral rehabilitation when working with edentulous Bihari patients

CONFLICT OF INTEREST

According to the authors, this article does not contain any potential conflicts of interest.

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